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EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/845,743

Applicant(s)

FEIST ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14,15,18. 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. The declaration of Dr. Thomas P. Feist has been received in the above identified application and has been carefully reviewed.

Examiner's Comments

3. The basis of the rejections noted below are identical to the final rejections in the Office Action mailed June 26, 2003 (Paper No. 13). The only changes are to clarify the record as to which specific evidentiary references are relied upon with regard to the various optimizations of properties.
4. The limitation "edge-lift height" is defined in the specification in Paragraph 0036 and is a "ridge at or near the edge of the substrate".

Request for Continued Examination

5. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on September 29, 2003 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

6. Claims 1 – 27, 30 – 53, 56 – 70 and 73 - 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. ('774) as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarow ('681), Stanish et al. ('495), Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403), Bonnebat et al. ('020), Mori et al. ('705 A1), Miyake et al. ('159), Kuromiya et al. ('989) and Oniki et al. ('083).

Regarding claims 1 - 4, 26 and 30 - 34, Landin et al. disclose a data storage media comprising a substrate comprising at least one plastic portion (*Figure 2, element 8 and col. 6, lines 1 – 2 and 42 – 67*), and at least one data layer on said substrate (*elements 6a and 6b*), wherein said data layer can be at least partly read from, written to, or a combination thereof by at least one energy field; and wherein when the energy field contacts said data storage media, said energy field is incident upon said data layer before it could be incident upon said substrate (*col. 2, line 63 bridging col. 3, line 8*).

Regarding claim 26, the examiner reminds applicants that “[t]he transitional phrase “consisting essentially of” limits the scope of a claim to the specified materials or steps “and those that do not materially affect the basic and novel characteristic(s)” of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original)” (MPEP § 2111.03). The MPEP explicitly states “[f]or search and examination purposes, absent a clear indication in the specification of what the basic and novel characteristics actually are, “consisting essentially of” will be construed as equivalent to “comprising.”

In the instant case, the basic and novel characteristics of the claimed invention are a substrate possessing a combination of low edge lift, low axial displacement and small surface roughness.

The MPEP further states “[w]hen an applicant contends that additional steps or materials in the prior art are excluded by the recitation of “consisting essentially of,” applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention”. In the court case cited in the MPEP, it should be noted the court's finding that “the court noted that appellants' specification indicated the claimed composition can contain any well-known additive such as a dispersant, and there was no evidence that the presence of a dispersant would materially affect the basic and novel characteristic of the claimed invention. ***The prior art composition had the same basic and novel characteristic (increased oxidation resistance) as well as additional enhanced detergent and dispersant characteristics***” [emphasis added] MPEP § 2111.03.

In the instant case, applicants have provided no arguments as to what additional steps or materials are intended to be excluded and, furthermore, the Examiner notes that applicants' specification indicates that additional materials do ***not*** materially effect the basic and novel characteristics (*specification, Paragraphs 0043, 0046 and 0056*). Therefore, the Examiner has interpreted the transitional phrase “consisting essentially of” as equivalent to “comprising” since applicants there is no evidence of record that the introduction of additional components would materially effect the basic and novel characteristics of the claimed invention.

Regarding the limitations directed to “an edge-lift height” and “an axial displacement peak”, the Examiner notes that it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily possess characteristics of claimed products where the rejection is based on *prima facie* obviousness under 35 USC 103. Therefore, the *prime facie* case can be rebutted by **evidence** showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). “When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.” *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

In the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*col. 5, lines 58 – 64; col. 11, lines 1 – 5; and examples*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of “an edge-lift height” and “an axial displacement peak” meeting applicants’ claimed limitations would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed limitations of “an edge-lift height” and “an axial displacement peak” would not have necessarily been present in every embodiment taught by Landin et al., it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables such as the “edge lift height” and “axial displacement peak” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge in the art that low values of the edge lift and axial displacement peak are desired for increased areal recording density as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarow ('681) and Stanish et al. ('495). In re Boesch, 205 USPQ 215 (CCPA 1980), In re Woodruff, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Landin et al. fail to disclose a surface roughness meeting applicants’ claimed limitations (i.e. less than 10 Å or less than 5 Å).

However, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variable “surface roughness” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge that extremely low (i.e. < 10 Å) surface roughness values are required for near-field high density recording media as evidenced by Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403) and Bonnebat et al. ('020).

Regarding independent claim 30, the claimed areal recording density is a function of the track width, track density and spatial location of the head relative to the medium, and is not a property solely of the media, per se, and therefor has been given

little weight in determining patentability since it is an intended-use limitation, as evidenced by Hartog et al. ('542); Tenhover et al. ('403) and Annacone et al. ('045). "[I]n apparatus, article, and composition claims, intended use must result in a **structural difference** between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. ***If the prior art structure is capable of performing the intended use, then it meets the claim.*** In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." [emphasis added] *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02.

Regarding claims 5 – 13, 35 – 38 and 51 - 53, these claims are directed to property limitations of the claimed medium that are not explicitly disclosed by the Landin et al. reference. However, in the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*col. 5, lines 58 – 64; col. 11, lines 1 – 5; and examples*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

- a mechanical damping coefficient greater than 0.04 and 0.06 at a temperature of 24 °C (claims 5, 6, 35 and 36);
- a moment of inertia of less than 5.5×10^{-3} slug-in², 4.5×10^{-3} slug-in² and 4.0×10^{-3} slug-in² (claims 7 and 51 – 53);

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- a radial and tangential tilt of less than 1° (claims 8 and 38);
- a moisture content which varies less than 0.5% at the claimed test conditions (claims 9 and 37);
- a specific gravity of less than 1.0 (claim 10);
- a resonant frequency of greater than 250 Hz (claim 11);
- a first modal frequency greater than an operating frequency (claim 12); and
- one or less modal frequencies less than an operating frequency (claim 13)

would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed property limitations would not have necessarily been present in every embodiment taught by Landin et al., it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables moment of inertia (as evidenced by Bonnebat et al. ('020) and the Quantegy article), the radial and tangential tilt (as evidenced by Sandstrom ('461), the Quantegy article, Zou et al. ('015), Czubarow ('681) and Stanish et al. ('495)), the moisture content variability (as evidenced by Czubarow ('681), Bonnebat et al. ('020) and the Quantegy article), the specific gravity (as evidenced by Mori et al. ('705 A1), Stanish et al. ('495) and Bonnebat et al. ('020)) and the number of modal frequencies less than an operating frequency of the substrate (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)), as well as increasing the mechanical

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damping coefficient (as evidenced by Landin et al. ('774); Mori et al. ('705)), resonant frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) and first modal frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) to values meeting applicants' claimed limitations since one of ordinary skill in the art at the time of applicants' invention would recognize that controlling all of these properties to within applicants' claimed limitations are necessary, and desirable, in order to achieve a dimensionally stable, high start-stop time recording media for high areal recording density applications.

Regarding claims 14, 17, 19, 20, 22, 23, 39, 42, 44, 45, 47 and 48, Landin et al. disclose cores meeting applicants' claimed limitations (i.e. solid or hollow cores having substantially constant thickness) (*Figures 2 – 4b, elements 8, 12a/12b, 32, 33, 35 and 52 – 54*).

Regarding claims 15, 16, 18, 40, 41, 43, 56 – 61, 63 and 64, Landin et al. disclose cores having varied thickness (*Figure 4b, where the core varies from zero to non-zero across the width of the medium – elements 52 – 54*). Landin et al. further teach that the damping layer dimensions can be controlled depending on the area with the greatest vibrational stresses (*col. 5, lines 25 – 30*). The exact geometry of the core is therefore deemed an obvious matter of design choice to control where the most damping occurs (as well as controlling the moment of inertia and specific gravity of the substrate), since such a modification of the core would have involved a mere change in the size of a component. A change in the size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

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Regarding claims 21, 27, 46, 62, 67, 69 and 70, Landin et al. disclose substrate and core materials meeting applicants' claimed limitations (*col. 5, lines 58 – 64; col. 6, lines 1 – 2 and 42 – 67; and col. 7, lines 23 – 67*).

The limitation “preformed cores” and “formed in situ with said substrate” in claims 24, 25, 49, 50, 65 and 66 are product-by-process limitation and are not further limiting in so far as the structure of the product is concerned. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. ***The patentability of a product does not depend on its method of production.*** If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” [emphasis added] *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP § 2113. Once a product appearing substantially identical is found, the burden shifts to applicant to show an ***unobvious*** difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). In the instant case, the final product is deemed to be the same whether the damping material (i.e. “core”) was formed along with the rest of the substrate or if the damping material was performed and then made into the substrate.

Regarding claims 73 – 75, Landin et al. disclose “pits and grooves” in the plastic portion of the substrate (*Figures 4 and 4b, elements 32, 33, 35, 52, 53 and 54*).

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7. Claims 28, 29, 54, 55, 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landin et al. as applied above, and further in view of Wu et al. ('422) for the reasons of record as set forth in Paragraph No. 4 of the Office Action mailed on June 26, 2003 (Paper No. 13).

8. Claims 1 – 14, 17, 18, 20, 21, 24 – 26, 30 – 39, 42, 43, 45, 46 and 49 – 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '921 A as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarow ('681), Stanish et al. ('495), Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403), Bonnebat et al. ('020), Mori et al. ('705 A1), Miyake et al. ('159), Kuromiya et al. ('989) and Oniki et al. ('083). See provided Derwent Abstract Translation of JP '921 A.

Regarding claims 1 - 4, 26 and 30 - 34, JP '921 A disclose a data storage media comprising a substrate comprising at least one plastic portion (*Abstract - "substrate formed of plastics"*), and at least one data layer on said substrate (*Abstract - "a magnetic layer"*), wherein said data layer can be at least partly read from, written to, or a combination thereof by at least one energy field; and wherein when the energy field contacts said data storage media, said energy field is incident upon said data layer before it could be incident upon said substrate (*in view of Figures since the protective lubricating layer is located between the magnetic layer and the side where the magnetic head would be*).

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Regarding claim 26, the Examiner has interpreted the transitional phrase "consisting essentially of" as equivalent to "comprising" for the reasons noted above.

Regarding the limitations directed to "an edge-lift height" and "an axial displacement peak", the Examiner notes that it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily possess characteristics of claimed products where the rejection is based on *prima facie* obviousness under 35 USC 103. In the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Abstract and Figures*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of "an edge-lift height" and "an axial displacement peak" meeting applicants' claimed limitations would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed limitations of "an edge-lift height" and "an axial displacement peak" would not have necessarily been present in every embodiment taught by JP '921 A, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables such as the

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“edge lift height” and “axial displacement peak” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge that low values of the edge lift and axial displacement peak are desired for increased areal recording density as evidenced by Sandstrom (‘461), Quantegy article, Zou et al. (‘015), Czubarrow (‘681) and Stanish et al. (‘495).

JP ‘921 A fail to disclose a surface roughness meeting applicants’ claimed limitations (i.e. less than 10 Å or less than 5 Å).

However, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variable “surface roughness” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge that extremely low (i.e. < 10 Å) surface roughness values are required for near-field high density recording media as evidenced by Hirata et al. (‘017), Annacone et al. (‘045), Yamaguchi (‘489), Hartog et al. (‘542 B1), Tenhover et al. (‘403) and Bonnebat et al. (‘020).

Regarding independent claim 30, the claimed areal recording density is a function of the track width, track density and spatial location of the head relative to the medium, and is not a property solely of the media, per se, and therefor has been given little weight in determining patentability since it is an intended-use limitation as evidenced by Hartog et al. (‘542), Tenhover et al. (‘403) and Annacone et al. (‘045).

Regarding claims 5 – 13, 35 – 38 and 51 - 53, these claims are directed to property limitations of the claimed medium that are not explicitly disclosed by the JP ‘921 A reference. However, in the instant case, the claimed and prior art products are

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substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Abstract and Figures*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

- a mechanical damping coefficient greater than 0.04 and 0.06 at a temperature of 24 °C (claims 5, 6, 35 and 36);
- a moment of inertia of less than 5.5×10^{-3} slug-in², 4.5×10^{-3} slug-in² and 4.0×10^{-3} slug-in² (claims 7 and 51 – 53);
- a radial and tangential tilt of less than 1° (claims 8 and 38);
- a moisture content which varies less than 0.5% at the claimed test conditions (claims 9 and 37);
- a specific gravity of less than 1.0 (claim 10);
- a resonant frequency of greater than 250 Hz (claim 11);
- a first modal frequency greater than an operating frequency (claim 12); and
- one or less modal frequencies less than an operating frequency (claim 13)

would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed property limitations would not have necessarily been present in every embodiment taught by JP '921 A, it would have been obvious to one having ordinary skill in the art to have minimized the cause

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effective variables moment of inertia (as evidenced by Bonnebat et al. ('020) and the Quantegy article), the radial and tangential tilt (as evidenced by Sandstrom ('461), the Quantegy article, Zou et al. ('015), Czubarrow ('681) and Stanish et al. ('495)), the moisture content variability (as evidenced by Czubarrow ('681), Bonnebat et al. ('020) and the Quantegy article), the specific gravity (as evidenced by Mori et al. ('705 A1), Stanish et al. ('495) and Bonnebat et al. ('020)) and the number of modal frequencies less than an operating frequency of the substrate (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)), as well as increasing the mechanical damping coefficient (as evidenced by Landin et al. ('774); Mori et al. ('705)), resonant frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) and first modal frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) to values meeting applicants' claimed limitations since one of ordinary skill in the art at the time of applicants' invention would recognize that controlling all of these properties to within applicants' claimed limitations are necessary, and desirable, in order to achieve a dimensionally stable, high start-stop time recording media for high areal recording density applications.

Regarding claims 14, 17, 20, 39, 42 and 45, JP '921 A disclose cores (*Figure 1, element 1a*) meeting applicants' claimed limitations (i.e. solid core having substantially constant thickness) (*Abstract*). The examiner notes that the plastic substrate (*element 1a*) is a core comprising at least one filled cavity (i.e. the entire layer is "filled").

Regarding claims 18 and 43, JP '921 A disclose a support for a magnetic recording medium wherein the medium can be in the form of a disk. A disk would result

in a plastic support (i.e. applicants' "core") being in the shape of a ring, thereby meeting applicants' claimed limitations.

Regarding claims 21 and 46, JP '921 A disclose substrate and core materials meeting applicants' claimed limitations (*Abstract – i.e. the entire core comprises plastics or composite materials composed of plastics and ceramic*).

The limitation "preformed cores" and "formed in situ with said substrate" in claims 24, 25, 49 and 50 are product-by-process limitation and are not further limiting in so far as the structure of the product is concerned for the reasons cited above.

9. Claims 15, 16, 19, 22, 23, 27, 40, 41, 44, 47, 48 and 56 – 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '921 A as applied above, and further in view of Landin et al. ('774) for the reasons of record as set forth in Paragraph No. 6 of the Office Action mailed on June 26, 2003 (Paper No. 13).

10. Claims 28, 29, 54, 55, 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '921 A as applied above, and further in view of Wu et al. ('422) for the reasons of record as set forth in Paragraph No. 7 of the Office Action mailed on June 26, 2003 (Paper No. 13).

11. Claims 1 – 14, 17, 18, 20, 21, 24 – 39, 42, 43, 45, 46 and 49 – 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang ('964 B1) as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarow ('681), Stanish et al.

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('495), Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403), Bonnebat et al. ('020), Mori et al. ('705 A1), Miyake et al. ('159), Kuromiya et al. ('989) and Oniki et al. ('083).

Regarding claims 1 - 4, 26 and 30 - 34, Chang discloses a data storage media comprising a substrate comprising at least one plastic portion (*Figures; col. 4, lines 23 – 57; and Example 1*), and at least one data layer on said substrate (*col. 3, lines 54 – 60 and Example 1*), wherein said data layer can be at least partly read from, written to, or a combination thereof by at least one energy field; and wherein when the energy field contacts said data storage media, said energy field is incident upon said data layer before it could be incident upon said substrate (*in view of Figures and col. 4, lines 14 - 21 since the protective and lubricating layers are located between the magnetic layer and the side where the magnetic head would be*).

Regarding claim 26, the Examiner has interpreted the transitional phrase “consisting essentially of” as equivalent to “comprising” for the reasons noted above.

Regarding the limitations directed to “an edge-lift height” and “an axial displacement peak”, the Examiner notes that it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily possess characteristics of claimed products where the rejection is based on *prima facie* obviousness under 35 USC 103. In the instant case, the claimed and prior art products are substantially identical in

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structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Figures; col. 4, lines 23 – 57 and Example 1*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of “an edge-lift height” and “an axial displacement peak” meeting applicants’ claimed limitations would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed limitations of “an edge-lift height” and “an axial displacement peak” would not have necessarily been present in every embodiment taught by Chang, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables such as the “edge lift height” and “axial displacement peak” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge that low values of the edge lift and axial displacement peak are desired for increased areal recording density as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarow ('681) and Stanish et al. ('495).

Chang fails to disclose a surface roughness meeting applicants’ claimed limitations (i.e. less than 10 Å or less than 5 Å).

However, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variable “surface roughness” to values meeting applicants’ claimed limitations through routine experimentation, especially given the

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knowledge that extremely low (i.e. $< 10 \text{ \AA}$) surface roughness values are required for near-field high density recording media as evidenced by Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403) and Bonnebat et al. ('020).

Regarding independent claim 30, the claimed areal recording density is a function of the track width, track density and spatial location of the head relative to the medium, and is not a property solely of the media, per se, and therefor has been given little weight in determining patentability since it is an intended-use limitation as evidenced by Hartog et al. ('542), Tenhover et al. ('403) and Annacone et al. ('045).

Regarding claims 5 – 13, 35 – 38 and 51 - 53, these claims are directed to property limitations of the claimed medium that are not explicitly disclosed by the Chang reference. However, in the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Figures; col. 4, lines 23 – 57 and Example 1*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

- a mechanical damping coefficient greater than 0.04 and 0.06 at a temperature of $24 \text{ }^{\circ}\text{C}$ (claims 5, 6, 35 and 36);
- a moment of inertia of less than $5.5 \times 10^{-3} \text{ slug-in}^2$, $4.5 \times 10^{-3} \text{ slug-in}^2$ and $4.0 \times 10^{-3} \text{ slug-in}^2$ (claims 7 and 51 – 53);
- a radial and tangential tilt of less than 1° (claims 8 and 38);

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- a moisture content which varies less than 0.5% at the claimed test conditions (claims 9 and 37);
- a specific gravity of less than 1.0 (claim 10);
- a resonant frequency of greater than 250 Hz (claim 11);
- a first modal frequency greater than an operating frequency (claim 12); and
- one or less modal frequencies less than an operating frequency (claim 13)

would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed property limitations would not have necessarily been present in every embodiment taught by Chang, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables moment of inertia (as evidenced by Bonnebat et al. ('020) and the Quantegy article), the radial and tangential tilt (as evidenced by Sandstrom ('461), the Quantegy article, Zou et al. ('015), Czubarrow ('681) and Stanish et al. ('495)), the moisture content variability (as evidenced by Czubarrow ('681), Bonnebat et al. ('020) and the Quantegy article), the specific gravity (as evidenced by Mori et al. ('705 A1), Stanish et al. ('495) and Bonnebat et al. ('020)) and the number of modal frequencies less than an operating frequency of the substrate (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)), as well as increasing the mechanical damping coefficient (as evidenced by Landin et al. ('774); Mori et al. ('705)), resonant

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frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) and first modal frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) to values meeting applicants' claimed limitations since one of ordinary skill in the art at the time of applicants' invention would recognize that controlling all of these properties to within applicants' claimed limitations are necessary, and desirable, in order to achieve a dimensionally stable, high start-stop time recording media for high areal recording density applications.

Regarding claims 14, 17, 20, 39, 42 and 45, Chang discloses cores (*Figures*) meeting applicants' claimed limitations (i.e. solid core having substantially constant thickness). The examiner notes that the core (*Figures 3 and 4*) is a core comprising at least one filled cavity (i.e. the entire layer is "filled").

Regarding claims 18 and 43, Chang discloses a support for a magnetic recording medium wherein the medium can be in the form of a disk (*col. 2, lines 60 – 61*). A disk would result in a plastic support (i.e. applicants' "core") being in the shape of a ring, thereby meeting applicants' claimed limitations.

Regarding claims 21 and 46, Chang discloses substrate and core materials meeting applicants' claimed limitations (*Figures and col. 4, lines 21 - 27 – i.e. the entire core comprises plastic*).

The limitation "preformed cores" and "formed in situ with said substrate" in claims 24, 25, 49 and 50 are product-by-process limitation and are not further limiting in so far as the structure of the product is concerned for the reasons cited above.

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Regarding claim 27, Chang discloses polymers meeting applicants' claimed limitations (*col. 4, lines 54 – 57*).

Regarding claims 28, 29, 54 and 55, Chang discloses coercivity values meeting applicants' claimed limitations (*col. 3, lines 54 – 57*).

12. Claims 15, 16, 19, 22, 23, 40, 41, 44, 47, 48 and 56 – 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang as applied above, and further in view of Landin et al. ('774) for the reasons of record as set forth in Paragraph No. 9 of the Office Action mailed on June 26, 2003 (Paper No. 13).

13. Claims 73 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang as applied above, and further in view of Lazzari ('967) for the reasons of record as set forth in Paragraph No. 10 of the Office Action mailed on June 26, 2003 (Paper No. 13).

14. Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang in view of Landin et al. as applied above, and further in view of Lazzari ('967) for the reasons of record as set forth in Paragraph No. 11 of the Office Action mailed on June 26, 2003 (Paper No. 13).

15. Claims 1 - 27, 30 – 53, 56 and 58 - 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. (JP '817 A) as evidenced by Sandstrom ('461).

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Quantegy article, Zou et al. ('015), Czubarow ('681), Stanish et al. ('495), Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403), Bonnebat et al. ('020), Mori et al. ('705 A1), Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083), Kikuchi ('259), Oishi ('420), Zagar et al. ('009), Fujii et al. ('550) and Vedamuttu ('391). See provided Abstract Translation of JP '817 A.

Regarding claims 1 - 4, 26 and 30 – 34, Otada et al. disclose a data storage media comprising a substrate comprising at least one plastic portion (*Abstract - "heat resistant plastic layer"*), and at least one data layer on said substrate (*Abstract "and magnetic layer"*), wherein said data layer can be at least partly read from, written to, or a combination thereof by at least one energy field; and wherein when the energy field contacts said data storage media, said energy field is incident upon said data layer before it could be incident upon said substrate (*in view of Figures and Abstract since the magnetic layer is deposited after the underlying layer and it is known in the art that the underlayers are located on the opposite side of the magnetic layer from the side where the magnetic head would be*).

Regarding claim 26, the Examiner has interpreted the transitional phrase "consisting essentially of" as equivalent to "comprising" for the reasons noted above.

Regarding the limitations directed to "an edge-lift height" and "an axial displacement peak", the Examiner notes that it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of obviousness has been established and the burden of proof is shifted to applicant to

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show that prior art products do not necessarily possess characteristics of claimed products where the rejection is based on *prima facie* obviousness under 35 USC 103. In the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Abstract and Figures*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of “an edge-lift height” and “an axial displacement peak” meeting applicants’ claimed limitations would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed limitations of “an edge-lift height” and “an axial displacement peak” would not have necessarily been present in every embodiment taught by Otada et al., it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables such as the “edge lift height” and “axial displacement peak” to values meeting applicants’ claimed limitations through routine experimentation, especially given the knowledge that low values of the edge lift and axial displacement peak are desired for increased areal recording density as evidenced by Sandstrom ('461), Quantegy article, Zou et al. ('015), Czubarrow ('681) and Stanish et al. ('495).

Otada et al. fail to disclose a surface roughness meeting applicants’ claimed limitations (i.e. less than 10 Å or less than 5 Å).

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However, it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variable "surface roughness" to values meeting applicants' claimed limitations through routine experimentation, especially given the knowledge that extremely low (i.e. $< 10 \text{ \AA}$) surface roughness values are required for near-field high density recording media as evidenced by Hirata et al. ('017), Annacone et al. ('045), Yamaguchi ('489), Hartog et al. ('542 B1), Tenhover et al. ('403) and Bonnebat et al. ('020).

Regarding independent claim 30, the claimed areal recording density is a function of the track width, track density and spatial location of the head relative to the medium, and is not a property solely of the media, per se, and therefor has been given little weight in determining patentability since it is an intended-use limitation as evidenced by Hartog et al. ('542), Tenhover et al. ('403) and Annacone et al. ('045).

Regarding claims 5 – 13, 35 – 38 and 51 - 53, these claims are directed to property limitations of the claimed medium that are not explicitly disclosed by the Otada et al. reference. However, in the instant case, the claimed and prior art products are substantially identical in structure and composition (i.e. a composite substrate formed from both rigid materials and plastic materials) (*Abstract and Figures*).

Therefore, in addition to the above disclosed limitations, the presently claimed properties of:

- a mechanical damping coefficient greater than 0.04 and 0.06 at a temperature of 24 °C (claims 5, 6, 35 and 36);

- a moment of inertia of less than 5.5×10^{-3} slug-in², 4.5×10^{-3} slug-in² and 4.0×10^{-3} slug-in² (claims 7 and 51 – 53);
- a radial and tangential tilt of less than 1° (claims 8 and 38);
- a moisture content which varies less than 0.5% at the claimed test conditions (claims 9 and 37);
- a specific gravity of less than 1.0 (claim 10);
- a resonant frequency of greater than 250 Hz (claim 11);
- a first modal frequency greater than an operating frequency (claim 12); and
- one or less modal frequencies less than an operating frequency (claim 13)

would have necessarily been present because the claimed and prior art products are substantially identical in structure and composition, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Furthermore, even in the instance that the claimed property limitations would not have necessarily been present in every embodiment taught by Otada et al., it would have been obvious to one having ordinary skill in the art to have minimized the cause effective variables moment of inertia (as evidenced by Bonnebat et al. ('020) and the Quantegy article), the radial and tangential tilt (as evidenced by Sandstrom ('461), the Quantegy article, Zou et al. ('015), Czubarrow ('681) and Stanish et al. ('495)), the moisture content variability (as evidenced by Czubarrow ('681), Bonnebat et al. ('020) and the Quantegy article), the specific gravity (as evidenced by Mori et al. ('705 A1), Stanish et al. ('495) and Bonnebat et al. ('020)) and the number of modal frequencies

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less than an operating frequency of the substrate (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)), as well as increasing the mechanical damping coefficient (as evidenced by Landin et al. ('774); Mori et al. ('705)), resonant frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) and first modal frequency (as evidenced by Miyake et al. ('159), Kuromiya et al. ('989), Oniki et al. ('083)) to values meeting applicants' claimed limitations since one of ordinary skill in the art at the time of applicants' invention would recognize that controlling all of these properties to within applicants' claimed limitations are necessary, and desirable, in order to achieve a dimensionally stable, high start-stop time recording media for high areal recording density applications.

Regarding claims 14, 17, 20, 39, 42 and 45, Otada et al. disclose cores (*Figures 1, 2 and 4, element 1*) meeting applicants' claimed limitations (i.e. solid core having substantially constant thickness) (*Abstract*). The examiner notes that the ceramic substrate (*Figures 1, 2 and 4 - element 1*) is a core comprising at least one filled cavity (i.e. the entire layer is "filled").

Regarding claims 15, 16, 18, 19, 22, 23, 40, 41, 43, 44, 47, 48, 56 - 61, 63, 64 and 67, Otada et al. disclose cores of composite substrates having varied thickness and multiple portions (*Figure 3, where the core varies from zero to non-zero across the width of the medium and wherein the interior sections of element 1 would be filled by the heat resistant plastic layer, resulting in a "core" layer comprising both ceramic and plastic, the entire "core" coated by additional heat resistant plastic*). The exact geometry of the core is therefore deemed an obvious matter of design choice to control

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where the most damping occurs (as well as controlling the moment of inertia and specific gravity of the substrate), since such a modification of the core would have involved a mere change in the size of a component. A change in the size is generally recognized as being within the level of ordinary skill in the art. In addition, it is known to one of ordinary skill in the art that the material and dimensions of the core will effect the damping properties, as well as the moment of inertia and specific gravity of the substrate (as evidenced by Landin et al. ('774), Otada et al. ('817 A), Annacone et al. ('045), Kikuchi ('259), Oishi ('420), Zagar et al. ('009), Fujii et al. ('550), Vedamuttu ('391), Mori et al. ('705 A1); Stanish et al. ('495), Bonnebat et al. ('020) and the Quantegy article).

Regarding claims 21, 46 and 62, Otada et al. disclose substrate and core materials meeting applicants' claimed limitations (*Abstract and Figures – “ the ceramic substrate 1”*).

The limitation “preformed cores” and “formed in situ with said substrate” in claims 24, 25, 49, 50, 65 and 66 are product-by-process limitation and are not further limiting in so far as the structure of the product is concerned for the reasons cited above.

Regarding claims 27 and 68, Otada et al. disclose plastics meeting applicants' claimed limitations (*Abstract – polyether imide*).

16. Claims 69 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. as applied above, and further in view of Landin et al. ('774) for the

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reasons of record as set forth in Paragraph No. 13 of the Office Action mailed on June 26, 2003 (Paper No. 13).

17. Claims 28, 29, 54, 55, 71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. as applied above, and further in view of Wu et al. ('422) for the reasons of record as set forth in Paragraph No. 14 of the Office Action mailed on June 26, 2003 (Paper No. 13).

18. Claims 73 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otada et al. as applied above, and further in view of Lazzari ('967) for the reasons of record as set forth in Paragraph No. 15 of the Office Action mailed on June 26, 2003 (Paper No. 13).

Response to Arguments

19. The rejection of claims 1 - 75 under 35 U.S.C § 103(a) – Various references

Applicant(s) argue(s) that the Examiner is relying upon improper hindsight in the above noted rejections, specifically that there is insufficient teaching or motivation in the prior art to produce a storage disk meeting the claimed property limitations. The Examiner respectfully disagrees.

Storage disks have been known in the art for many years, as evidenced by the declaration of Dr. Feist. The operation of storage disks have likewise been known in the art, e.g. at least one data layer is provided one or both surfaces of the disk, data is

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stored in the layer and read/written by a head located above or below the storage disk. Areal recording density, something that is well known to all inventors in the field, is a factor of how small the data storage domains can be made (i.e. more domains = more recorded bits = greater recording density) and how accurately and quickly the domains can be reproduced/written (i.e. relative location of the head to the data layer, where the closer the head is to the data layer, the more accurately small domains can be read). Clearly, uniformly produced, flat surfaces are required for any data storage disks to function optimally (imagine a magnetic head trying to read a disk with vastly changing elevations while rotating at an extreme rate of speed).

For example, "edge-lift height", axial displacement peak, radial tilt and tangential tilt are all essentially measurements of how "flat" a disk surface is, as noted in the rejections of record. The Examiner deems that one of ordinary skill in the art would be well aware that producing flat, uniform disks would be desirable for allowing the read/write head to be positioned as close as possible to the data surface. Therefore the only "optimization" required is to reduce the defects and non-uniformity of the disk to be as small as possible (i.e. 0), which reads on the claimed property ranges since all the above are desired to be "less than" certain numerical value. Since it is known in the art that 0 edge lift height is desired, 0 axial displacement is desired, 0 radial tilt is desired and 0 tangential tilt is desired (again, as evidenced by the supplied prior art references), applicants are merely claiming what every inventor knowingly strives for. No evidence has been provided that any specific combination of materials or properties must be utilized to obtain the claimed "minimal" values or that the substrates disclosed by the

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prior art references would be physically incapable of obtaining them. The fact that prior art disks *can* be made with edge lift heights, axial displacement peaks, radial tilts and tangential tilts (or any property) greater than 0 is merely a trade-off between cost-effective disks versus the flattest, smoothest, most uniform disks obtainable based upon the knowledge in the field. Again, there is no evidence of record that applicants have discovered some combination of properties that is unobtainable or non-obvious over the prior art references, especially given that the prior art knowledge to optimize the various properties as cited in the rejections of record.

Applicants further argue that the declaration of Dr. Feist provides evidence that the relied upon references fail to teach or suggest the claimed invention, especially regarding the "floppy" substrates of the Chang invention. The Examiner respectfully disagrees.

The Examiner notes that Dr. Feist is a co-author of the present invention and has acknowledged that a desire to increase areal recording density is known in the art (see *Paragraphs 10 and 11 of declaration*). Dr. Feist further argues that, regarding the Chang reference "it is not obvious or even logical to think that a floppy disk has an edge lift height of less than $8\ \mu$, a surface roughness of less than about $10\ \text{\AA}$, and an axial displacement peak of less than about $500\ \mu$ under shock or vibration excitation" (*Paragraph 12*), but has provided no experimental evidence illustrating that the Chang reference either does not necessarily possess these properties or *cannot* possess these properties. The Examiner does not find the declaration convincing since the properties such as "edge lift height" and surface roughness are simply a matter of insuring uniform

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polishing and deposition and are deemed to easily be obtainable if not necessarily present.

While the Examiner acknowledges the language “floppy” implies certain characteristics of the disks formed, the Examiner again notes that the properties that applicants’ are claiming may or may not be necessarily present in the substrates formed according to the Chang reference, especially the example using a *metal* core. The Examiner notes that metals can be made to have extremely flat, uniform surfaces and applicants have provided no measurements of the Chang example to illustrate that it either does not necessarily possess the claimed properties, is incapable of obtaining the claimed properties, or both.

Finally, applicants argue that the substrate of Landin et al. has “pits and grooves” while the claimed substrate does not, thereby not reading on the claimed invention. The Examiner respectfully disagrees.

The Examiner notes that applicants’ claims are open to pits and grooves since pits and grooves are not deemed to materially effect the basic and novel characteristics for the reasons of record.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 10-247318-A teaches a substrate with a “foundation layer” designed to minimize the radial curl in the disk (*Derwent Abstract*). JP 06-195700-A and DE 4326296-A1 teach substrates possessing non-uniform thickness in the radial

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directions (*Derwent Abstracts and Figures*). Katsuki (U.S. Patent No. 4,725,470) teach adding low weight material into a cavity formed in a substrate for both cushioning and for controlling the overall density of the disk (*Figure and entire disclosure*).

21. This is a RCE of applicant's earlier Application No. 09/845,743. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



KMB
November 14, 2003



Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700